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The making of knowledge cities in Romania

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Abstract

The 'Knowledge City' can be considered first the supreme objective and then an instrument of knowledge society with its own principles and its distinguishing characteristics and processes. One of the main question remains as how close is the position of Romanian urban areas to the category of knowledge city. Given the characteristics of Romanian cities on culture, science, technology and innovation, and policies in urban, economic and social development, I conclude that Romania must adopt firstly a unified and coherent long term development strategy for a "healthy" economy. The paper will try to emphasize the position possibility of Romanian cities in the category of knowledge city based on the concept of knowledge city, the principles, characteristics and processes of a knowledge city, taking into account the theoretical approach and empirical evidences. In this regard, I will use the background offered by literature and the official statiscal data for analysis to identify the key success factors of few Romanian urban areas which explain the posible 'candidature' to the quality of knowledge city. I estimate the analysis to confirm the hypothesis that there are good aspects, but also deficiencies that require major solutions and policy options for designing Romanian cities as emerging knowledge cities. We consider that the paper can be a useful viewpoint, which allows researchers to include other sources of information for researching an in a much more complex approach.

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1. Introduction

Cities and, in general, urban areas are considered the main drivers of economic growth, in addition to social

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and cultural diversity, across the European Union countries. The new challenge of the last two decades of the knowledge society is to develop 'knowledge cities'. As a result, a number of cities adopted 'knowledge city' strategies, which have become important development mechanisms for cities in the knowledge era. A number of cities around the world promote themselves as 'Knowledge cities', such as Barcelona, Boston, Helsinki, Ottawa, Singapore (World Capital Institute and Teleos, 2009; Yigitcanlar, 2007) and other cities aspire to this status through urban development programs that target knowledge-based development (Brisbane, Dubai, Kyoto, Melbourne, Shanghai) (Ergazakis, Metaxiotis, and Psarras, 2004).

Achieving to a 'Knowledge city' is an ambitious project for Romania with many challenges, where the main question is: 'Can be considered Romanian urban areas able to achieve to the category of 'knowledge city'?!'.

2. An overview on the 'Knowledge city'

The concept of 'knowledge city' (KC) evolves similar concepts as 'knowledge-based clusters' (Arbonies and Moso, 2002), 'ideopolis' (Garcia, 2004), 'technopolis' (Smilor, Gibson, and Kozmetsky, 1988) or 'digital, intelligent or smart city'(Yigitcanlar, O'Connor, and Westerman, 2008b), and is more and more used as a correspondent of knowledge based urban development or of sustainable form of urban development in the rapid evolution of knowledge society. One of the main conditions of 'knowledge city' is that local authorities to develop strategies focussed on innovation, science and creativity within the context of an expanding knowledge economy and society (Yigitcanlar, O'Connor, and Westerman, 2008b). In this regard a knowledge city can be seen as an integrated city, which physically and institutionally combines the functions of a science park with civic and residential functions (Yigitcanlar, O'Connor, and Westerman, 2008b). Knowledge city is considered that offers one of the effective paradigms for the sustainable cities of the future (Yigitcanlar, 2007; Yigitcanlar and Martinez-Fernandez, 2007) or knowledge and culture incubator driven by knowledge workers through a strong knowledge production in a knowledge industry (Work Foundation, 2002; Yigitcanlar, Velibeyoglu, and Baum, 2008a).

The review of literature highlights that there are a number of components with special characteristics that form a 'Knowledge City', as following: i) The economic component, which creates high value-added products using research, technology, and brainpower (Yigitcanlar and Lee, 2009; Carrillo, 2006); ii) The socio-cultural component facilitates exchange of ideas, and the possibility to turn these ideas into products, services, and innovative solutions to urban problems, incubating creativity to ensure economic growth, urban development, and socio-cultural and psychological wellbeing of the citizens (Yigitcanlar and Lee, 2009; Landry, 2000); iii) The quality of life and place component takes into account the high level of public service and the conservation and development of the cultural, aesthetic and ecological values that give cities their character to attract knowledge workers (Yigitcanlar and Lee, 2009); iv) Urban diversity component is expressed in a cosmopolite atmosphere, accepting others with open channels for communication and knowledge exchange (Yigitcanlar and Lee, 2009); v) Accessibility and connectivity component emphasis the seamless links with other knowledge centres by the networks of good international and regional transport and information technology infrastructure (Yigitcanlar and Lee, 2009); vi) Social equity component is a key dimension of sustainable urban economic growth. In a society where social tensions and conflicts such as social exclusion and unemployment discourage both knowledge workers and investing firms away from a region of perceived social danger (Yigitcanlar and Lee, 2009).

Knowledge City is considered an important issue of the debates for international organisations, local authorities of cities, researchers and practitioners during the last two decades. However, institution such as World Bank (1998), or European Commission (2000), United Nations and OECD (2001) have trying to create a knowledge management framework for strategic directions regarding global/world development. The fundament of this framework is the link created between knowledge management and urban development (Komninos, 2002; Ergazakis, Metaxiotis, Psarras, 2006). Some city administrations (Barcelona, 2003; Dublin Chamber of Commerce, 2004) make their strategies based on the values of Knowledge Based Urban.

The fundamental aspects taking into consideration as key ingredients or development tools for the creation of

a Knowledge City are considered: i) technology and communication; ii) creativity and culture; iii) human capital; iv) knowledge workers; v) and urban development clusters and their spatial relationships.

Regarding first aspect, some authors (Ergazakis, Metaxiotis, Psarras, 2006; Larsen, 1999) emphasise the idea that 'Knowledge City' through high level of *technology and communication* implementation gives to citizen access to a better education, training and services; in this way strengthening the human capital. Another development tool is *creativity and cultural infrastructure*, because urban areas or cities that have strong cultural elements are the places that attract intelligent workers, who are addicted to places of cultural vibrancy and variety (Florida, 2002), where they are possibility to build and foster a knowledge base and therefore to encourage new businesses (Ergazakis, Metaxiotis and Psarras, 2006; Yigitcanlar, Baum, and Horton, 2007). Regarding *human capital*, Ergazakis, Metaxiotis and Psarras (2006) bring to the forefront the development of strategies for investments in human capital (i.e. university), as an important path of urban areas transformation into Knowledge Cities. Therefore, universities are knowledge institutions considered both: 'drivers' of Knowledge Cities and 'anchors' for knowledge workers (Garrett-Jones, 2007). From this derives the importance of *knowledge workers,* who generate performance of the economies through their creativity in problem solving, applying lifelong learning and developing their innovative skills (Florida, 2005). Regarding *urban development clusters and spatial relationships*, the main accent is put on the providing numerous opportunities for interaction, provide opportunities for the development of relationships and trust between businesses and employees, and facilitating exchange of ideas of knowledge institutions clusters (Larsen, 1999; Leibovitz, 2004). World Capital Institute (2014) propose some common KC attributes which can be synthetize on a major characteristic, respectively a more sustainable economy, which uses and exploits especially its resources but not only (cultural, natural, human capital, knowledge workers, etc.) with new technologies based on digital area, network of institution/enterprise connected, becoming leader in culture industry with greater community commitment to pro-environment decision making.

3. The strategy cycle of sustainable development in Romania – first steps through 'Knowledge city'

The answer for the question: 'Are prepared Romanian urban areas to accede to knowledge cities?!', requires first few clarifications about the implementation of sustainable development in Romania. However, developing a long-term vision and setting concrete objectives, are two initial key steps of a strategic process which must be followed (ESDN Quarterly Report December 2007) by a country (see Fig. 1).

For Romania, sustainable development is the only rational prospect for advancement as a nation, resulting in the establishment of a new development paradigm at the confluence of economic, social and environmental factors (Government of Romania, 2008). In this respect, public policies that are being developed by Romania, such as Romania's National Sustainable Development Strategy, seek to develop a knowledge-based economy, protecting and improving the quality of the environment in ways that use human capital more effectively.

The aim of urban planning in the era of knowledge based economy is to achieve a sustainable development by creating a strong urban core, harnessing its economic strength and addressing social exclusion and avoiding physical dereliction.

Romania is an upper-middle income country economy with a GDP of around 131478 million Euro and a GDP per capita of 7100 Euro in 2013 (Eurostat). Industrial output growth reached 6.5% year-on-year in February 2013, the highest in the EU-28. Romanian urban areas try to have at their disposal the knowledge, scientific understanding, technology, skills and financial means to tackle the challenge to develop 'knowledge cities'. The Nomenclature of Territorial Units for Statistics (NUTS-3 level divisions) of European Union reflect Romania's administrative-territorial structure, and correspond to the 41 counties plus Bucharest. The cities and communes correspond to the NUTS-5 level divisions, but there are no current NUTS-4 level divisions. The possible urban areas which can be developed in future as 'knowledge cities' are Bucharest, Cluj-Napoca, Sibiu, Brasov, Iasi and Timisoara.

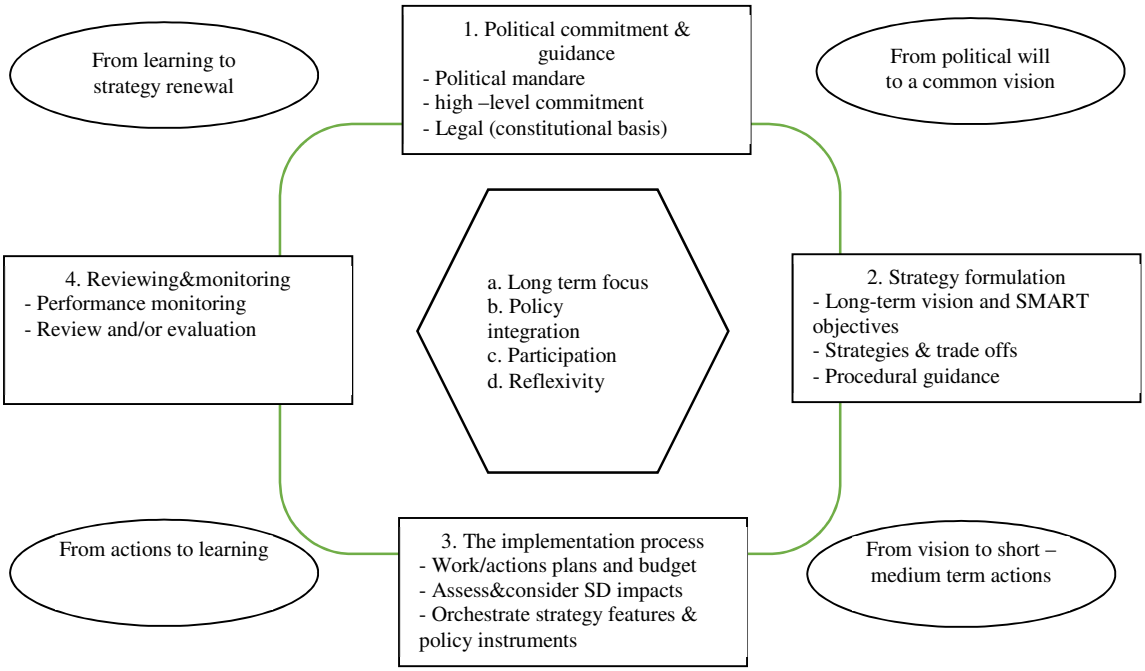

Fig. 1. The Sustainable Development strategy cycle, where principles are a) to d) and steps are 1) to 4) (Steurer, loosely based on Volkery et al. 2006)

Taking into account the development tools for the creation of a Knowledge City, regarding the first one, technology and communication, the role of technology for the development of a Knowledge City has been recognized by the Romanian Government with the launch of the e-government portal (www.e-guvernare.ro), with on-line public information and e-services that facilitates a wide range of electronic transactions between citizens, businesses and public administration. The Romanian e-government implementation started early 2000 and received the appreciation of best practice at international level in 2005. Other e-government applications at national level are: i) The Electronic System for Public Acquisitions e-Procurement (http://www.seap.ro/, http://www.e-licitatie.ro), which it is the most successful Romanian e-Government project from the point of view of financial impact and number of users (between March 2002 and October 2006, in the 650,000 auctions realised, the Romanian state obtained savings over 178 mil. EUR); ii) The Virtual Payment Desk (www.ghiseul.ro); iii) The IT System for the electronic attribution of international authorisations on transport goods (autorizatiiauto.ro); iv) The Educational Informatised Program (AEL, http://portal.edu.ro/index.php) - represents a computer assisted learning system very successful 8th several international recognitions, such as: in 2005, the eEurope Awards for eGovernment, in Manchester; and the 1st place in the World Summit Award for Information Society, held in Tunis; in 2007 it was nominated in the International Project Excellence Awards 2007 – among the six best world projects; in February 2008, in the European IT Excellence Awards 2008, category Independent Software Vendors (ISV) - Vertical Market; v) Tax payment by electronic means (local) e-tax, which was conceived in order to facilitate for the citizens the payment of local taxes; vi) The national computerized high school/vocational school admission and distribution (ADLIC) represents the IT based system used in Romania since 2001, on national scale, for centralizing the 8th grade final results and distributing the graduates in high-schools and vocational schools.

According to a Net Index report from the end of the first half of 2013, Timișoara is the city with the highest download speed in the world - 89.91 Mbit/s. Bucharest is providing to the citizens the largest number of online services (Stoica and Ilas, 2009).

Regarding creativity and cultural infrastructure, Romania drives the economy into areas that are fuelled by innovation and creativity. Sibiu has the best preserved historical sites in the country, many museums and exhibitions, proximity to the mountains. In 2007, Sibiu was the European Cultural Capital (together with Luxembourg) and Iasi hope to gain this recognition in 2021, being one of the largest Romanian city, once the historic capital of the Moldavian principality until 1861, and for some time capital of Romania. Today it is one of the major economic and cultural centres in the country, together with Bucharest - the capital of Romania, Cluj-Napoca, Brasov and Timisoara. They also have a long and rich history, with beautiful buildings and historical sites, featuring a mixture of architectural styles, such as baroque, rococo, and Renaissance. Bucharest was called 'the little Paris' between the first and the second world war and has a growing cultural scene, in fields including the visual arts, performing arts and nightlife.

Regarding human capital, Romania develop strategies which implies free education in Universities, the number of students being very high (Bucharest - 16 public universities and 19 private universities, Brasov – 8 universities, Cluj-Napoca – 10 universities, Iasi - 5 public universities and 4 private universities, Sibiu – 5 universities, Timisoara - 8 public universities and 8 private universities). Cluj-Napoca housing one of the largest universities in Europe, and Iasi has the oldest higher education institution in Romania (1860). Universities of Romania have prestige at national and international level and cooperates with world-wide universities and are members of some of the most important university networks and associations: the Coimbra Group, University Agency of Francophony and the Network of Francophone Universities (RUFAC), European University Association, Utrecht Network, International Association of Universities, etc. These partnerships offer the opportunity to experience changes, to have student and teacher mobilities and joint academic, research and strategy programmes. At the preuniversity level of education, the Educational Informatised Program (AEL) involved in time more than 3,000,000 pupils and 75,000 teachers as users, with over 4800 schools involved and more than 100 mil. Euro financial effort only in the period 2001-2005

Regarding 'knowledge workers', the use of e-procurements by some public institutions in specific conditions/for certain category of products, forced the companies interested to win/obtain public contracts to have a staff with IT highly-skills. In Romania the most common knowledge workers are composed by managers and administrators, professionals and associate professionals.

Regarding 'urban development clusters and spatial relationships', many international companies in all industrial and service sectors find Romania attractive.

An analysis of Romanian urban areas according of the unified Knowledge Based Urban Development (KBUD) framework developed by Sarimin, Yigitcanlar and Parker (2010) and adapted by author on data available for Romania on the progress of becoming knowledge cities (Appendix A) show that Romania make some steps but the process is still at the beginning.

Conclusion

Despite the important progress it has been made in recent years, it is a fact that Romania's economy still try to face the new challenges offered by knowledge society to make steps to sustainability, seeking to absorb and implement the principles and practice of sustainable development in the context of knowledge society. It's true that Romania has its 'own landscape of aspects' that can sustain the quality of 'the candidate' to knowledge city of some urban areas, and with efficient strategies developed by state and local governments to attract investment and create jobs in the knowledge sector, with a focus primarily on international development, maybe the future will be more open for this perspective. The experience of actual knowledge cities in the world demonstrates that the strategies must focuses primarily on promoting new politics, building continuously a learning society, developing e-government, growing the industries of the future, boosting e-commerce, improving infrastructure

and access, connecting communities, developing culture, until the 'the candidate' to knowledge city becomes prosperous, innovative, culturally vital, attractive, with people focused permanently on planning instrument and mechanisms for a sustainable knowledge city.

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Appendix A. Overview on Romanian urban areas selected according KBUD framework

Domains	Characteristics	Indicators	Parameters	Bucharest	Brasov	Cluj-Napoca	Iasi	Sibiu	Timisoara
Society (Socio Cultural Development)	Quality of Life	Housing Affordability	No. of housing	692019	95617	119378	100309	53905	124777
			The average no. of persons per household	2.39	2.34	2.45	2.46	2.50	2.28
		Community facilities	% of population with access to garbage collection services	96%	76%	88%	75%	78%	83%
	Human & Social Development	White collar jobs	%of white collar: blue collar jobs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
		Literacy rate	% of literacy rate	99.99%	99.91%	99.76%	99.69%	99.85%	99.80%
	Intellectual Capital	Level of education	% of population with tertiary education	28.72%	23.55%	25.63%	24.83%	22.96%	26.26%
		K-workers	Employees in research and development	14553	1799	3098	2398	591	2805
Environment (Urban Development)	Quality of Place	Green area	The area from the development regions occupied by green area	5.85%	36.72%	21.25%	11.88%	36.72%	25.97%
		Urban amenities	Ratio of selected urban amenities per capita	n.a.	n.a.	n.a	n.a.	n.a	n.a.
	Sustainability	Public transport initiative	% of government budget on public transport	n.a	n.a.	n.a	n.a.	n.a	n.a.
		Environmental Programmes	% of central budget on environmental programmes	21.54%	10.34%	10.38%	6%	10.34%	9.21%
	Unique Identity	Cultural factors	No. of international cultural events	336	n.a	n.a	n.a	n.a	n.a
		Cultural facilities	No.	n.a	n.a	n.a	n.a	n.a	n.a
Economy (Economic Development)	Knowledge-based	Knowledge industries and businesses	No. of knowledge industries and	n.a	n.a	n.a	n.a	n.a	n.a

			businesses						
		R&D centres	No. of R&D centres	n.a	n.a	n.a	n.a	n.a	n.a
	Competitive	Turnover from innovation	Turnover from innovation as % of total turnover by economic sector	12.7%	12.6%	21.7%	8.1%	12.6%	9.4%
		Active entrepreneurs	No. of active entrepreneurs	104695	17617	24258	14902	10353	21182
	Creative and Innovative	Creative industries	The innovative enterprises having placed on the market new or significantly improved products	898	422	496	461	422	168
		Patents	No. of patents per year	n.a	n.a	n.a	n.a	n.a	n.a
Management (Governance)	Strategic and integrated	Vision of organisations	Direction of vision of the organisation	n.a	n.a	n.a	n.a	n.a	n.a
		Multidisciplinary personnel	No. of personnel within the organisation	n.a	n.a	n.a	n.a	n.a	n.a
	Democratic and Transparent	E-government	-e-government applications at national level: functional -e-tax: functional	yes	yes	yes	yes	yes	yes
		E-submission	No. of e-submission for planning application	n.a	n.a	n.a	n.a	n.a	n.a
	Social equity	Wealth distribution	% of wealth distribution among the 20% richest	n.a	n.a	n.a	n.a	n.a	n.a
		Access to employment	% of unemployment	4.6%	10.5%	6.8%	5.8%	10.5%	6%

Note: data available for 2010-2012

Source: computed by author using data available of NIS of Romania, adapted after KBUD framework developed by Sarimin, Yigitcanlar and Parker (2010)

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